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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/711,234	11/13/2000	Naoki Kohara	10873.472USD1	6974
23552	7590	06/16/2004	EXAMINER	
MERCHANT & GOULD PC P.O. BOX 2903 MINNEAPOLIS, MN 55402-0903			ALANKO, ANITA KAREN	
			ART UNIT	PAPER NUMBER
			1765	

DATE MAILED: 06/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

09/711,234

KOHARA ET AL.

Examiner

Art Unit

Anita K Alanko

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 4/23/04 amdt.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 15, 17-24 and 26-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15, 17-24, 26-28 and 30-35 is/are rejected.
- 7) ☒ Claim(s) 29 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 15, 17-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kola et al (US 6,005,197), Ishihara et al (US 5,032,694) and Holmes et al (US 4,153,518).

Kola discloses a method for producing a flexible thin film capacitor comprising:
providing a flexible substrate 11 (col.4, line 14);

forming a first metal electrode film 12, an inorganic high dielectric film 15 and a second metal electrode film 18, 19 in this order on the substrate 11 using respective masks (Fig.1-Fig.8);

wherein the first metal electrode film, the inorganic high dielectric film and the second metal dielectric film are formed in contact with the substrate, thereby being integrated with the substrate.

Kola does not explicitly disclose that the substrate comprises organic polymer. Ishihara teaches that useful flexible substrates include polyimides (col.2, lines 41-42), which encompasses an organic polymer. It would have been obvious to use an organic polymer as the substrate in the method of Kola because Ishihara teaches that they are useful materials for flexible substrates for circuits.

Kola also does not disclose to form a metal oxide adhesive film on the substrate. The circuit in the method of Kola includes tantalum 12 (col.1, line 57) as the lower electrode.

Ishihara teaches that it is useful to form an adhesive film comprising tantalum oxide 5 for tantalum film circuits 1a (col.3, lines 55-60) to improve adhesion between the substrate and the tantalum circuit. Ishihara, in other embodiments, forms a blanket layer of the adhesion layer 4 over the complete substrate (Figures 4, 5, 8(c) and 9). Ishihara teaches that tantalum oxide also improves adhesion between circuit 1a (palladium 2/tantalum 1a) and insulating layer 3 (col.3, lines 61-67). It would have been obvious to one with ordinary skill in the art to deposit a blanket metal oxide adhesive layer on the substrate in the method of Kola and then to form the first metal electrode, the inorganic high dielectric film and the second metal electrode film over, in contact and integrated with the metal oxide film on the substrate because Ishihara teaches that tantalum oxide layers improve adhesion, which would increase the lifetime of the final product.

It is noted that Ishihara deposits the metal oxide adhesive layer 4 on the sidewalls of conductive layers 1a and 2. However, this is not needed in the method of Kola because in Kola all of the layers are integrated with the substrate, and a simple blanket metal oxide adhesive layer would improve adhesion to all layers in contact with the substrate without the need for a further deposition step to form tantalum oxide on the sidewalls (since tantalum oxide 15 is already present on the sidewalls of electrode 12 as part of the method to form the inorganic high dielectric film).

As to amended claim 15, the modified method of Kola teaches a metal oxide adhesive film of tantalum oxide or the like (see Ishihara, col.4, lines 29-30), not for example the list of cited metal oxide adhesive layer in claim 15. Holmes teaches that refractory metal oxide adhesive layers are known, for example tantalum oxide, titanium oxide or tungsten oxide (col.3, lines 9-11). It would have been obvious to one with ordinary skill in the art to use titanium oxide

or tungsten oxide in the modified method of Kola because Holmes teaches that titanium oxide or tungsten oxide are useful refractory metal oxides as an alternative to tantalum oxides.

As to claim 17, Kola discloses to form metal adhesive films 12, 13 (for example, titanium, col.1, lines 64-col.2, line 9).

As to claim 18, Kola discloses to form the metal electrode film by DC magnetron sputtering (col.1, lines 57-59).

As to claims 19 and 21, Kola discloses that the dielectric layer may be formed by CVD (col.4, lines 31-33). Since the same method is used in Kola as claimed, it is expected to encompass the same deposition rate.

As to claim 20, Kola discloses to form the dielectric by anodization (col.2, lines 16+), which is expected to encompass formation at a temperature up to 300 °C.

As to claim 22, Ishihara teaches to use sputtering to form the metal oxide adhesive film (col.5, lines 66-67). Holmes also teaches that sputtering or CVD is a useful method for forming metal oxide adhesive films (col.3, lines 1-11). It would have been obvious to use RF or ECR magnetron sputtering to deposit the metal oxide adhesive film in the method of Kola because Ishihara teaches to use sputtering and RF and ECR magnetron sputtering are conventional sputtering techniques or because Holmes teaches that sputtering or CVD are useful techniques for forming metal oxides.

As to claim 23, Kola teaches in a different embodiment that a useful technique for forming tantalum oxide is to form a metal film and then to treat it with a solution, wherein the metal layer is formed by DC magnetron sputtering (col.1, lines 57-58, col.1, lines 16-25). It

would have been obvious to form the metal oxide adhesive film using the technique taught by Kola because Kola teaches that it is a useful technique for forming metal oxide films.

As to claim 24, it would have been obvious to anodize using one of the cited acids because they are functionally equivalent to citric acid for anodization.

Claims 15, 17-24, 26-28, 30-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kola et al (US 6,005,197), Ishihara et al (US 5,032,694), Lebow et al (US 4,159,222) and Holmes (US 4,153,518).

The discussion of Kola modified by Ishihara from above is repeated here.

As to claim 26, Kola does not disclose to form a peeling film. Lebow discloses a method comprising:

forming a peeling film 12 on a base of metal 14;
applying an organic polymer material 10 onto the peeling film; and
curing by light irradiation (col.3, lines 17+), thereby forming the substrate formed of organic polymer on the peeling film.

It would have been obvious to one with ordinary skill in the art to use the method of Lebow to form the substrate in the modified method of Kola because Lebow teaches that it is useful for forming fine line resolution printed circuits with removable substrates.

As to claims 27-28, examiner takes official notice that the conventional photoresist or photosensitive material used in the method of Lebow includes one selected from the Markush group cited in claim 27, and the methods cited in claim 28 are conventional methods for forming them.

As to claims 30-33, Lebow discloses to peel, but does not disclose how. It would have been obvious to one with ordinary skill in the art to use the techniques cited in claims 30-33 because they are conventional methods of removing polymer films from substrates.

Allowable Subject Matter

Claim 29 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the closest prior art (Lebow) teaches to use a metal as the peeling film, not silicon oxide or silicon nitride, as in the context of claim 29.

Response to Amendment

The 35 USC 112 rejection is withdrawn. The claims are now rejected over Kola, Ishihara and Lebow and Holmes. Claim 29 is objected to, but would be allowable in independent form.

Response to Arguments

Applicant's arguments have been considered but are moot in view of the new grounds of rejection. Holmes is newly cited to teach that refractory metal oxide films are known and useful.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anita K Alanko whose telephone number is 571-272-1458. The examiner can normally be reached on Mon,Tues & Fri: 8:30 am-5 pm; Wed&Thurs:10 am-2 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Anita K Alanko
Primary Examiner
Art Unit 1765